37. A method of identifying genes suitable for use in the development of pesticides or cancer therapies, the method comprising the steps:

providing Drosophila fly lines which display a lethal or semi-lethal phenotype having been generated using the technique of P-element transposon-tagged insertion;

conducting plasmid rescue so as to isolate nucleic acid surrounding the site of transposon insertion; and

utilizing the isolated nucleic acid to clone a larger portion of nucleic acid containing a complete essential gene.

38. A method of identifying genes suitable for use in the development of pesticide or cancer therapies, the method comprising the steps of:

providing Drosophila fly lines which display a lethal or semi-lethal phenotype having been generated using the technique of P-element transposon-tagged insertion;

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conducting plasmid rescue so as to isolate nucleic acid surrounding the site of transposon insertion;

utilising the isolated nucleic acid to clone a larger portion of nucleic acid containing a complete essential gene; and

utilising the larger portion of nucleic acid in hybridisation studies to identify an essential gene from another organism such as a mammal.

39. A screening assay for identifying compounds which have a physiological effect on an organism, the assay comprising the steps of:

a) reacting a test compound with a protein encoded by an essential gene comprising a sequence selected from the group consisting of SEQ ID Nos. 1-902, specific fragment thereof, or homologue thereof, from the organism; and

b) detecting any modulatory effect the compound has on the protein.

40. A screening assay for identifying compounds which have a physiological

effect on an organism, the assay comprising the steps of:

a) reacting a test compound with a protein encoded by an essential gene comprising a sequence selected from the group consisting of SEQ ID Nos. 430-783 and 899-902, specific fragment thereof, or homologue thereof, from the organism; and

b) detecting any modulatory effect the compound has on the protein.

41. The screening assay according to claim 39 wherein the effect on the protein is a negative modulation.

42. The screening assay according to claim 39 wherein the assay is a ligand binding assay for detecting the effect the compound has on the ligand binding of the protein

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43. The screening assay according to claim 39 wherein the assay is a functional activity assay for detecting the effect the compound has on the functional activity of the protein.

44. The screening assay according to claim 43 wherein the functional activity assay is selected from the group consisting of kinase assays; protein phosphatase assays; adenyl cyclase assays; guanylyl cyclase assays; phosphodiesterase assays; nucleosidease assays; protease assays; protein secretion and/or import assays; nuclease assays; DNA metabolism assays; transcription factor assays; apoptosis assays; calcium utilisation assays; receptor/ion channel assays; and G protein assays.

45. A compound having modulatory activity on a protein encoded by an essential gene, as identified by an assay according to claim 39.

46. A pesticidal formulation comprising a compound according to claim 45, together with a pesticidally acceptable excipient.

47. A pesticidally active compound identified by an assay according to claim 37 and further tested for its ability to kill pests.

48. A method of selectively modulating activity, in an organism, of a protein encoded by an essential gene comprising a sequence selected from the group consisting of SEQ ID Nos. 1-902 or a specific fragment thereof, or homologue thereof, comprising administering a compound that selectively modulates activity of the protein in the organism.

49. The method according to claim 48, wherein the selective modulation in activity of the protein has the result of substantially eliminating or severely reducing the activity of the protein, as compared to the activity of the protein without modulation.

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50. The method according to claims 48, wherein the compound modulates the activity of the protein and has a minimal modulatory effect on other proteins of the organism.

51. The method according to claim 46, wherein the modulation in activity of the protein has the effect of being lethal or semi-lethal to the organism.

52. A method of modulating activity, in an organism, of a protein encoded by an essential gene comprising a sequence selected from the group consisting of SEQ ID Nos. 1-902 or a specific fragment thereof, or homologue thereof, comprising administering a compound, that selectively modulates activity of the protein, to an organism, and wherein the ability of the protein to modulate the activity of the protein is determined by:
- exposing the protein which has been produced by a genetically engineered cell expressing the protein, with the compound for a period of time;
- measuring the activity of the exposed protein using a ligand binding or functional activity assay; and

- comparing the activity of the exposed protein with an activity of a control protein which has not been exposed to the compound, so that compounds that modulate the protein activity are identified.

53. The method according to claim 52, for selectively modulating activity, in an organism, of a protein, further comprising the steps of:
- exposing a further cellular protein(s) of the organism to the compound for a period of time;
- measuring the activity of said further protein(s) using an assay(s) appropriate for such a purpose; and
- comparing the activity of said exposed further cellular protein(s) with an activity of a control protein(s) which has not been exposed to the compound, so that compounds that substantially do not, or minimally modulate said further cellular protein(s) activity, are identified.

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54. A method of identifying compounds having a potentially pesticidal activity caused by modulation of a protein encoded by an essential gene comprising a sequence selected from the group consisting of SEQ ID Nos. 1-902 or a specific fragment thereof, or homologue thereof, which comprises;

- obtaining the protein by heterologous expression of the essential gene in a host cell;
- employing the protein in an assay according to claim 39 for detecting a compound which displays modulatory activity on the protein; and
- testing the compound which displays modulatory activity on the protein for its pesticidal activity on an organism.

55. A compound identified by the method according to claim 54 as having pesticidal activity.

56. A pesticidal formulation comprising a compound according to claim 55

identified as having pesticidal activity, together with a pesticidally acceptable excipient

57. A method for the production of a pesticidal composition comprising identifying a compound that displays pesticidal activity using the method according to claim 54 and mixing the compound identified, or a derivative, or an analogue thereof, with a pesticidally acceptable carrier.

58. An isolated polynucleotide fragment comprising a sequence selected from the group consisting of SEQ ID Nos.430-783 and 899-902, a fragment thereof, or a homologue thereof.

59. An essential gene comprising a sequence selected from the group consisting of SEQ ID Nos.430-783 and 899-902, a fragment thereof, or a homologue thereof.

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60. An isolated polynucleotide which hybridises under stringent conditions to a polynucleotide fragment selected from the group consisting of SEQ ID Nos. 430-783 and 899-902 or a fragment thereof.

61. An essential gene comprising a sequence selected from the group consisting of SEQ ID Nos.430-783 and 899-902, a fragment thereof, or a homologue thereof.

62. An expression vector comprising the essential gene according to claim 61.

63. An expression vector according to claim 62 comprising one or more control sequences capable of directing the replication and/or expression of an operatively linked essential gene.

64. A prokaryotic or eukaryotic host cell comprising the expression vector

according to claim 62.

65. A method of producing a polypeptide comprising culturing a host cell according to claim 64 under conditions permitting expression of the polypeptide.

66. A polypeptide produced by the method of claim 65.

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67. A method of identifying and facilitating isolation of an essential gene from an organism, comprising the steps of:

providing a polynucleotide fragment comprising a sequence selected from the group consisting of SEQ ID Nos. 430-783 and 899-902, or a fragment thereof; and

allowing the polynucleotide fragment to specifically hybridise to nucleic acid from the organism such that a corresponding essential gene from the organism is identified.

REMARKS

The above amendment to the specification has been made to claim priority to the identified PCT and British patent applications. The above claims have been amended to better conform to U.S. practice. Applicants respectfully request substantive examination on the merits.

Respectfully submitted,

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